PTO 06-4900

Japanese Patent
Document No. S60-111353

DOUBLE-SIDED INFORMATION CARRIER DISC

[Ryomen Joho Tantai Disiku]

Isamu Inoue and Masami Uchida

UNITED STATES PATENT AND TRADEMARK OFFICE
Washington, D.C. June 2006

Translated by: Schreiber Translations, Inc.

Country	:	Japan
Document No.	:	S60-111353
Document Type	:	Kokai
Language	:	Japanese
Inventor	:	Isamu Inoue and Masami Uchida
Applicant	:	Matsushita Electric Industrial Co., Ltd.
IPC	:	G 11 B 7/24 9/06
Application Date	:	November 21, 1983
Publication Date	:	June 17, 1985
Foreign Language Title	:	Ryomen Joho Tantai Disiku
English Title	:	DOUBLE-SIDED INFORMATION CARRIER DISC

Specification

1. Title of the invention

Double-sided information carrier disc

2. Patent Claim

A double-sided information carrier disc characterized by the facts that a replica to which the signal plane of an original disc has been transferred is designated as N_1, that a replica to which the signal plane of said replica N_1 has been transferred is designated as N_2, that a replica to which the signal plane of said replica N_2 has been transferred is designated as N_3, that a replica to which the signal plane of the replica N_n (wherein n is a positive integer) has been transferred is designated, in general terms, as N_{n+1}, and that the replica N_n & replica N_{n+1} are joined.

3. Detailed explanation of the invention

(Industrial application fields)

The present invention concerns a disc, above all a double-sided information carrier disc which must meet the requirement of quickly accessing all information on a double-sided optical disc and which may, for example, be used for the memory device of a computer.

(Constitution of the prior art and its problems)

[1] Numbers in the margin indicate pagination in the foreign text.

Double-sided discs are normally prepared for the purpose of doubling the information memorizing capacity per optical disc, and in particular, a double-sided disc endowed with a doubled capacity in both nominal & actual terms, namely a disc capable of playing back or re-playing back information from both sides without flip-flopping the front & rear sides of the optical disc or without reversing the disc rotating direction, has come to be required for a computer memory device for the purpose of abbreviating the access time.

The structure of an optical disc substrate used for a computer memory is shown in Figure 1. In Figure 1, (1) is an optical disc substrate, where the tracking pregroove (3), address signal (4), etc. are preliminarily configured on the signal track (2) for quickly accessing signals. Even in a case where a pair of such optical disc substrates (1) are simply joined in a state where the respective signal planes are configured in opposition to one another according to the illustration of Figure 2, as in the prior art, it is impossible to meet the aforementioned requirement. Most importantly, in a case where the initial end signal & final end signal of the address signals (4) in Figure 1 are designated respectively as (4-1) & (4-2) and where the pair of optical disc substrates (1) shown in Figure 2 are assumed to be rotated counterclockwise as they are viewed from above, the lower substrate (1) can be normally played back by the optical pickup (5) from signal (4-1) to (4-2) sides, and address /2 decoding actions can be invoked, whereas the decoding actions of the upper substrate (1) are invoked along the direction opposite the default direction, namely from signal (4-2) to (4-1) sides.

It is necessary, from the standpoint of decoding the signals of the upper disc substrate along the direction identical to that for the lower disc, namely from (4-1) to (4-2), to encode signals along the opposite direction of the signal encoding direction of the lower substrate.

(Objective of the invention)

The objective of the present invention is to provide a double-sided optical disc which possesses, on the respective discs thereof, signals of mutually opposite directions, which can uneventfully decode signals by using both optical pickups (5) & (6) in a case where a constitution provided by joining the respective discs in a state where the respective signal planes thereof are configured in opposition to one another is rotated, and which can be also be manufactured both simply & inexpensively.

(Constitution of the invention)

The present invention concerns a double-sided information carrier disc characterized by the facts that the replica N_1 (master), to which the signal plane of an original disc has been transferred, is prepared, that the replica N_2 (mother), to which the signal plane of the aforementioned replica N_1 has been transferred, is subsequently prepared, that the replica N_3 (stamper) & replica N'_3 (one optical disc substrate), to which the signal plane of the aforementioned replica N_2 has been transferred, are then prepared, that the replica N_4 (other optical disc substrate), to which the signal plane of the aforementioned replica N_3 has been transferred, is then prepared, and that the replica N'_3 and the aforementioned replica N_4, which each bear a signal morphology equivalent to that of the aforementioned replica N_3, are then joined in a state where their respective signal planes are configured in opposition to one another.

(Explanation of application examples)

Figures 3 show processes for manufacturing an optical disc. In the process 1 shown in Figure 3 (a), an original disc (10) on which the depressed signal track (11) has, for example, been formed is prepared. (12) is a pregroove provided for tracking purposes, whereas (13) signifies address signals, whereas (13-1) is designated as the initial end of the address signals (hereafter abbreviated as the "signal initial end"), whereas (13-2) is designated as the final end of the same (hereafter abbreviated as the "final end""). In the process 2 shown in Figure 3 (b), the master disc (14) made of Ni, which possesses the protuberant signal track (15) and to which the signal plane (10-1) of the aforementioned original disc (10) has been transferred, is prepared. Next, in the process 3 shown in Figure 3 (c), the mother disc (16) made of Ni, which possesses a depressed signal track (11) identical to that of the original disc (10) and to which the signal plane (14-1) of the aforementioned master disc (14) has been transferred, is prepared.

Next, in the process 4 shown in Figure 3 (d), the stamper disc (17) made of Ni, which possesses the protuberant signal track (15) identical to that of the master disc (14) and to which the signal plane (16-1) of the aforementioned mother disc (16) has been transferred, is prepared. Moreover, in the process 4' shown in Figure 3 (e), the first optical disc substrate (17') made of a transparent material, on which a protuberant signal track (15) identical to that formed in the process 4 has been transferred from the mother disc (16) according to procedures similar to those of the process 4, is prepared. Next, in the process 5 shown in Figure 3 (f), the second optical disc substrate (18) made of a transparent material, which possesses the depressed signal track (11) and to which the signal plane (7-1) of the aforementioned stamper disc (17) has been transferred, is prepared.

The first & second optical disc substrates (17') & (18) prepared in the previous processes are, upon the completion of a process not shown in the figure whereby specified recording films,

etc. are formed on their respective signal planes (17'-1) & (18'-1), mutually joined in a state where their respective signal planes (17'-1) & (18'-1), are configured in opposition to one another according to the illustration of Figure 4, as a result of which the singular double-sided disc (19) becomes prepared. In a case where the disc (19) thus prepared is rotated counterclockwise as it is viewed from above, both the optical pickups (20) & (21) can record the address signals from (13-1) to (13-2). Thus, it becomes possible, according to the foregoing constitution of the present invention, to prepare, with extreme ease, a double-sided disc both sides of which can be played back or re-played back without flip-flopping the front & rear sides or changing disc rotating direction. Incidentally, depressed & protuberant signal tracks are mutually equivalent from an optical standpoint, and no troubles whatsoever are incurred at the times of recording & playing back signals.

Moreover, the present invention is not limited to optical discs and can also be applied to discs of different formats (e.g., electrostatic capacitance-type discs, etc.) or to playback-only discs.

In the case of a playback-only double-sided disc, for example, the original disc A & original disc B in possession of concurrently ordered signal strings are provided, and a replica prepared as a result of transfer, at the N-th [address?], from the original disc A and a replica prepared as a result of transfer, at the N+1st [address?], from the original disc B are mutually joined.

(Effects of the invention)

As has been explained above, the present invention provides a double-sided disc characterized by the facts that a replica to which the signal plane of an original disc has been transferred is designated as N_1, that a replica to which the signal plane of said replica N_1 has been

transferred is designated as N_2, that a replica to which the signal plane of said replica N_2 has been transferred is designated as N_3, that a replica to which the signal plane of the replica N_n (wherein /3 n is a positive integer) has been transferred is designated, in general terms, as N_{n+1}, and that the replica N_n & replica N_{n+1} are joined in a state where the respective signal planes thereof are configured in opposition to one another, whereas it becomes possible, since there is no need to prepare separate original discs bearing signals encoded along mutually opposite directions for the front side & rear side and since a single original disc suffices, to obtain, in extremely simple & inexpensive manners, a double-sided optical disc capable of simultaneously invoking playback or recording & playback actions from the front & rear sides without flip-flopping the front & rear sides or changing the disc rotating direction.

4. Brief explanation of the figures

Figure 1 is a diagram which shows a partial oblique view of an information carrier disc, whereas Figure 2 is a diagram which shows a recording or playback state where a double-sided information carrier disc of the prior art has been separated into a pair of upper & lower members, whereas Figures 3 (a), (b), (c), (d), (e), & (f) are disc partial oblique view diagrams which show the respective processes for manufacturing the double-sided information carrier disc of an application example of the present invention, whereas Figure 4 is a diagram which shows a partial oblique view of a recording or playback state where the same disc has been separated into a pair of upper & lower members.

Names of agents: Toshio Nakao, patent attorney, and one other

Figure 1

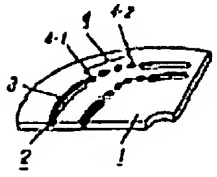
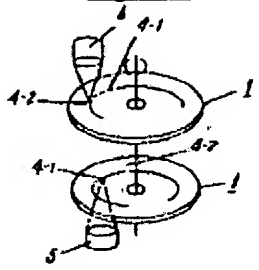


Figure 2



Figures 3

(a-f)

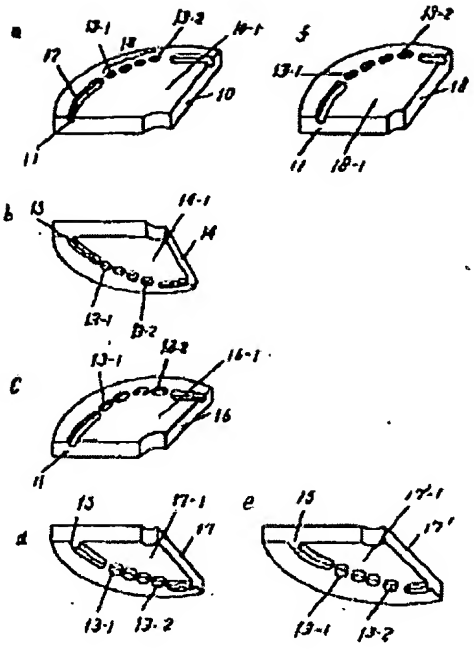
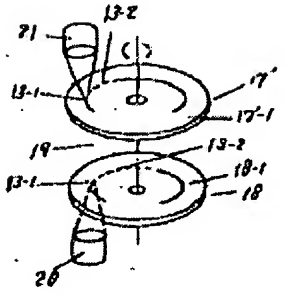

a
13-1
13-2
14-1
17
15
10
11
б
13-2
13-1
18
11
18-1
b
13
14-1
14
13-1
13-2
C
13-1
13-2
14-1
16
11
d
13
17-1
17
13-1
13-2
e
13
17'-1
17'
13-1
13-2

Figure 4 /4


13-2
21
13-1
17'
17'-1
19
13-2
13-1
18-1
18
20